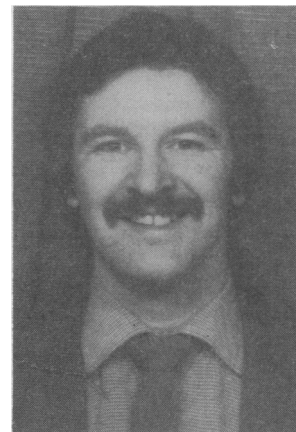


KARATE AND KARATE INJURIES

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ABSTRACT

The origins of karate and its evolution as a sport are described. Karate injuries tend to occur in three main areas: the head and neck, the viscera, and the limbs. Effective legislation controlling karate, which could help prevent injuries, is lacking at the moment and should be established. Recommendations for the prevention of injury include the introduction of weight classes, mandatory provision of protective equipment such as padded flooring, and the outlawing of certain uncontrollable methods of attack.

The word karate has been derived from modern-day Japanese and means "empty hand". It is said to have evolved in the Luchu islands after they were conquered by the Kyushu in 1609. The story goes that the inhabitants were forbidden to carry weapons of any type and therefore developed an empty-handed form of self-defence, which allowed them to punch through the bamboo armour of their oppressors, or dismount horse-men with the flying spinning kicks that are the hallmark of traditional karate in contests. This oppression also allowed the evolvement of the use of farm implements as effective weapons. Karate is particularly popular as a sport in Great Britain today. The Martial Arts Commission reckons that there are around 30,000 registered karateka, with a further 30,000 unregistered. It is interesting to note that until 1977 the Great Britain team held the World Championship title, but lost it in Japan during that year. At the present time there is no effective legislation to control the sport. The efforts of the Martial Arts Commission to bring all forms of karate under the control of a single governing body are constantly being thwarted by political manoeuvres within the karate set-up itself.

Basically the contests are of three types: controlled or traditional karate, semi-contact karate, and full-contact karate. In the controlled sport the competition lasts for only two or three minutes. Points are scored when a blow, either a punch or a kick, breaks through an opponent's defence to reach his head, face or trunk. Since no actual contact is made, the referee must decide whether or not the blow was crippling or fatal, so to

referee a karate competition requires a pretty active imagination. Full points or half points are scored depending on the style and power of the technique. (The forces involved in karate have been calculated by Feld, an American physicist, himself a karateka. The speed of a straight punch is reckoned to be around 7m/sec, that of a roundhouse kick about 10m/sec. These blows can exert a force of around 675 lbs per sq. in.). In the semi-contact sport, certain targets are exempt from attack. In the full-contact sport, blows of unmitigated force are directed at the target areas. This sport is rather like boxing with rounds of three minutes duration.

Injuries occur to three main areas: the head and neck, the abdominal organs, and the limbs. It is not really surprising that karate injuries can be severe when one considers that the original intention of the martial art was to kill or maim an opponent. Since it has been transformed into sport we must take effective measures to ensure the safety of competitors; they themselves are not knowledgeable of their own anatomy nor of the effect they can produce by their techniques, and it is our responsibility as doctors to inform them of the possibility of serious injury. The action they take after that is their own decision but governing bodies and participants, coaches and referees must be made totally aware of the effects or potential effects of blows.

1. Head and neck injuries

The most common injuries are lacerations, abrasions, nose bleeds, and black eyes. They only cause withdrawal

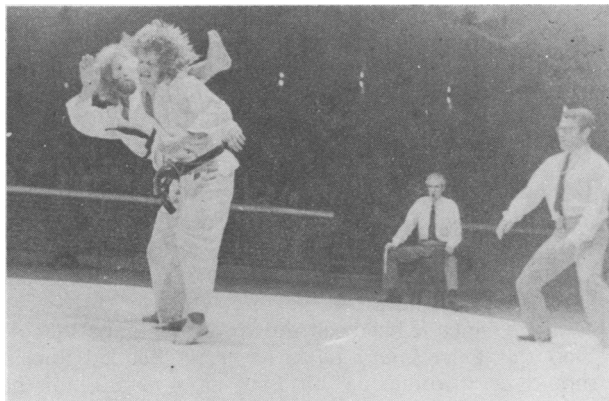


Fig. 1: An example of the roundhouse kick. Note that the competitors are wearing neither padding to the hands or feet. The man who sustained the kick was rendered unconscious for several minutes.

when bleeding is persistent or the eye is closed due to periorbital swelling. Treatment is usually simple, either steristrip or sutures. It is important to remember that nasal fracture can occur and present with the classical features of a boxer's nose. Another common fracture is fracture of the zygoma, with a palpable depression on the affected side of the face, double vision, trismus and paraesthesia due to infra-orbital nerve entrapment.

A study of injuries that occurred over the past five years showed that concussion is frequent, and serious head injury is potentially very common, especially from a concussive blow to the chin when the injured participant falls backwards and strikes his head on the hard floor; padded flooring is not yet standard in all competitions, and the most serious head injuries result from this mechanism. The other causes of serious injuries are the roundhouse kick and the spinning back kick. Depressed skull fractures and blow-out fractures of the orbit have been seen as a result of roundhouse kicks, and cervical dislocation from a spinning back kick has occurred in one individual. It is my feeling that the latter technique should be outlawed, since once initiated it cannot be controlled. Strict control regarding contact with roundhouse kicks should be exercised.

2. Visceral injuries

The abdominal injury most commonly seen is the classical winding due to a blow in the region of the solar plexus surrounding the coeliac ganglia. This produces transient inspiratory difficulty with spontaneous recovery within 20 to 40 seconds. The lungs can be damaged by direct blows, punches, and kicks producing rupture. The liver, spleen, and kidneys are vulnerable to roundhouse kicks, and the pancreas is also a common site of injury. Testicular injury due to uncontrolled

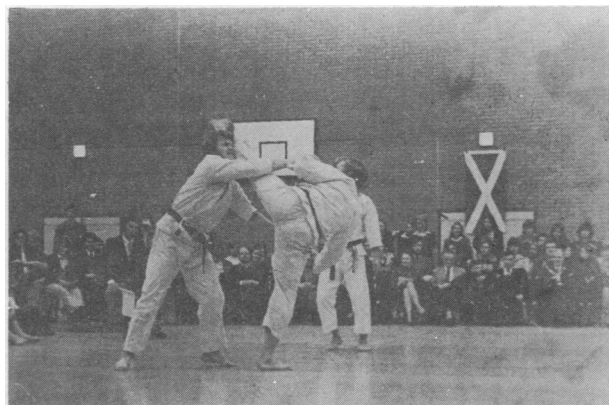


Fig. 2: This competitor succeeded in "stepping inside" his opponents spinning back kick and thereby avoided serious injury. Again note the absence of padding. Competitors are also fighting on a solid floor.

kicks is acutely painful and forces retirement from competition. The use of proper groin guards certainly diminishes this risk, but it is still the case that many competitors refuse to wear them; the governing bodies now disqualify such competitors.

3. Injuries to the limbs

The hands, which are the weapons of attack, and the feet are often injured during attempts to carry out techniques. Digital dislocations and sprains may occur during attempts to block blows. The commonest fracture seen in the hands is at the neck of the second metacarpal; Bennet's fracture to the base of the thumb, radial or lateral collateral ligament avulsion fractures, and dislocation of the thumb are also seen. These are all acutely painful and often prevent a man returning to his work. The high roundhouse kick is occasionally blocked by the upper arm and the radial nerve is injured as it winds round the humerus producing wrist drop. Peripheral nerve injuries also seen regularly are produced by attempts to sweep one's opponent to the floor (in which case the superficial peroneal nerve is injured), or by attempts to kick high. Further potentially serious complications of the sweeping kicks are fascial compartment compression of the legs, and quadriceps haematoma. Severe bruising of the large muscles of the thighs can be a chronic source of pain if subsequent calcification occurs, myositis ossificans. Another less described, very serious condition is traumatic anterior tibial compartment syndrome, which may require surgical decompression if the viability of the limb is to be maintained. First aid treatment consists of ice packs, elevation of the limb, and mandatory withdrawal from the competition. Knee injuries occur with frequency and are usually the meniscus type. The mechanism is much the same as the footballer's knee injury, because the

grounded foot in a roundhouse kick allows the femur to rotate firmly on the tibial tables, compressing and tearing the cartilage.

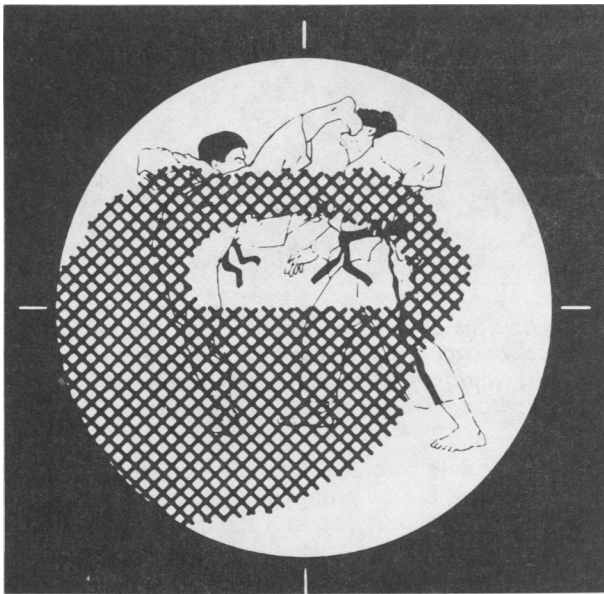


Fig. III: The cross hatched area represents the loss of vision sustained by a man who received a roundhouse kick to the left orbit. This caused an orbital blow-out fracture which has left him permanently partially sighted. The injury is further compounded by the fact that he was already blind in his right eye!

Recommendations for the prevention of injury

Prevention of injury is both immediate and remote. Immediate prevention is in the hands of the referee, while remote prevention is the responsibility of the governing body, which must legislate for its own sport, and support the referees' decisions.

Since most fights are at catchweight at present it would be reasonable to introduce weight classes into karate. It is felt that medical cover should be available at all competitions where more than 20 karateka compete, since it has been shown when numbers greater than this exist injury tends to occur. Padded flooring should be introduced; (Lindsay, et al, 1980) this has been shown in boxing to prevent serious head injury after an initial concussive blow knocks the opponent down. Many of the spinning back kicks should be excluded from competition.

One final point is that with the media promotion of the martial arts, karate-type murders have been described. The first was described by Camps in 1959 when a young soldier was found with peculiar injuries to his neck. These consisted of bilateral vertical tears to both carotid arteries, and fracture of the thyroid cartilage. In court it became apparent that while the aggressor rested his defence in the non-use of an offensive weapon, he had in fact delivered several knife hand chops to the neck of his victim. Other murders have been reported in some detail by Watson of Glasgow. Also, from the psychological aspect, one wonders frequently if the participation in combat sport creates an increase in aggressiveness outside.

REFERENCE

Lindsay, K. W., McLatchie, G. R. and Jennett, B., 1980. Brit.Med.Jnl. 281: 789-791.

CHAIRMAN'S CLOSING REMARKS

In closing the symposium, the Chairman expressed thanks to the speakers, to the organisers, Franklin Scientific Projects, to the sponsors, Messrs. Upjohn Ltd. and to the administrators of the Wembley Conference Centre.